

Claims

1. Single-sidedly or double-sidedly pressure-sensitively adhesive, elastic adhesive
5 sheet which can be used more than once and is preferably in the form of diecuts or cut shapes, intended for the redetachment of adhesive bonds without residue or damage, particularly on low-strength substrates such as paper, for example, by peeling and/or extensive stretching of the adhesive sheet, characterized in that

10 the adhesive sheet is composed of at least one layer of a pressure-sensitive adhesive,

the adhesive sheet has a maximum stretchability of more than 200% and a recovery of more than 60% after stretching to 2/3 of its maximum elongation, and the pressure-sensitive adhesive (PSA) of the adhesive sheet is based on a
15 chemically crosslinked polyurethane, the starting materials for the chemically crosslinked polyurethane including at least one isocyanate-reactive substance having a functionality of more than 2.0, in a fraction of at least 5% by weight, based on the polyurethane composition, where

20 the molecular weight of at least one of the starting materials used to form the polyurethane is greater than or equal to 1000,

at least difunctional polyisocyanates are used to form the polyurethane, and

the ratio of maximum tensile stress to stripping stress is more than 1.2, preferably more than 1.5, more preferably more than 2.0, and

25 the tensile stress at an elongation of 200% is not more than 2.0 N/mm², preferably not more than 1.0 N/mm², more preferably not more than 0.5 N/mm².

2. Elastic adhesive sheet according to Claim 1, characterized in that the
30 polyurethane is composed of the following starting materials which are reacted with one another in the stated proportions:

at least one difunctional polyisocyanate,

a combination of at least one polypropylene glycol diol and at least one polypropylene glycol triol, the ratio

of the number of hydroxyl groups in the diol component to the number of hydroxyl groups in the triol component being preferably between 0.7 and 9.0, more preferably between 1.5 and 2.5,

of the number of isocyanate groups to the total number of hydroxyl groups being between 0.5 and 1.3, preferably between 0.8 and 1.2, more preferably between 0.95 and 1.05,

where diols having a molecular weight of less than or equal to 1000 are combined with triols whose molecular weight is greater than 1000, preferably greater than or equal to 3000, or diols having a molecular weight of greater than 1000 are combined with triols whose molecular weight is less than 1000.

3. Elastic adhesive sheet according to Claim 1 or 2, characterized in that the adhesive sheet has a maximum stretchability of more than 300%, preferably more than 400% and/or a recovery of more than 80%, preferably more than 90% after stretching to 2/3 of its maximum elongation.

4. Elastic adhesive sheet according to at least one of Claims 1 to 3, characterized in that the polyisocyanate is an aliphatic or alicyclic diisocyanate, preferably an aliphatic or alicyclic diisocyanate having an asymmetrical molecular structure.

5. Elastic adhesive sheet according to at least one of Claims 1 to 4, characterized in that the isocyanate is isophorone diisocyanate.

6. Elastic adhesive sheet according to at least one of Claims 1 to 4, characterized in that isocyanate-reactive substances used are polyols such as polyether-polyols or polyester-polyols.

7. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that a backing sheet has been applied to one side of the pressure-sensitive adhesive.

8. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that the elastic adhesive sheet is a two-ply or multi-ply laminate composed of one or more elastic backing sheets and one or more layers of the

polyurethane-based pressure-sensitive adhesive.

9. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that the adhesive sheet has been executed in partially non-tacky form at one or more ends, so that there are one or more grip tab regions starting from which the parting of the adhesive bond can be performed advantageously.
10. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that formulating constituents such as catalysts, ageing inhibitors (antioxidants), light stabilizers, UV absorbers, rheological additives and other auxiliaries and additives have been mixed in.
11. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that the adhesive sheet has peel strengths (bond strengths) on steel, determined at a peel angle of 90°, of between 0.05 and 8 N/cm.
12. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that the stripping forces measured during detachment by extensive stretching in the bond plane are less than 2.5 N/mm².
13. Elastic adhesive sheet according to at least one of the preceding claims, characterized in that it is in the form of diecuts or cut shapes.
14. Process for producing a pressure-sensitive adhesive sheet according to at least one of the preceding claims, where
 - a) a vessel A is charged substantially with the premixed isocyanate-reactive substances (polyol component) and a vessel B is charged substantially with the isocyanate component, it being possible for the other formulating ingredients to have been mixed into these components beforehand in a standard mixing procedure,
 - b) the polyol component and the isocyanate component are conveyed via precision pumps through the mixing head or mixing tube of a multi-component mixing and metering unit, where they are homogeneously mixed and so brought to reaction,

- c) the chemically inter-reactive components mixed in this way are applied immediately thereafter to a sheet-like backing material which is preferably moving at a constant speed,
 - d) the backing material coated with the reactive polyurethane composition is passed through a heating tunnel in which the polyurethane composition cures to give the pressure-sensitive adhesive,
 - e) finally the coated backing material is wound up in a winding station.
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15. Use of a pressure-sensitive adhesive sheet according to at least one of the preceding claims for fastening notes, sheets of paper, calendar pages, strips, cards or cartons of paperboard, cardboard or plastic, small utility articles of plastic, wood, glass, stone or metal.